

FIG. 1

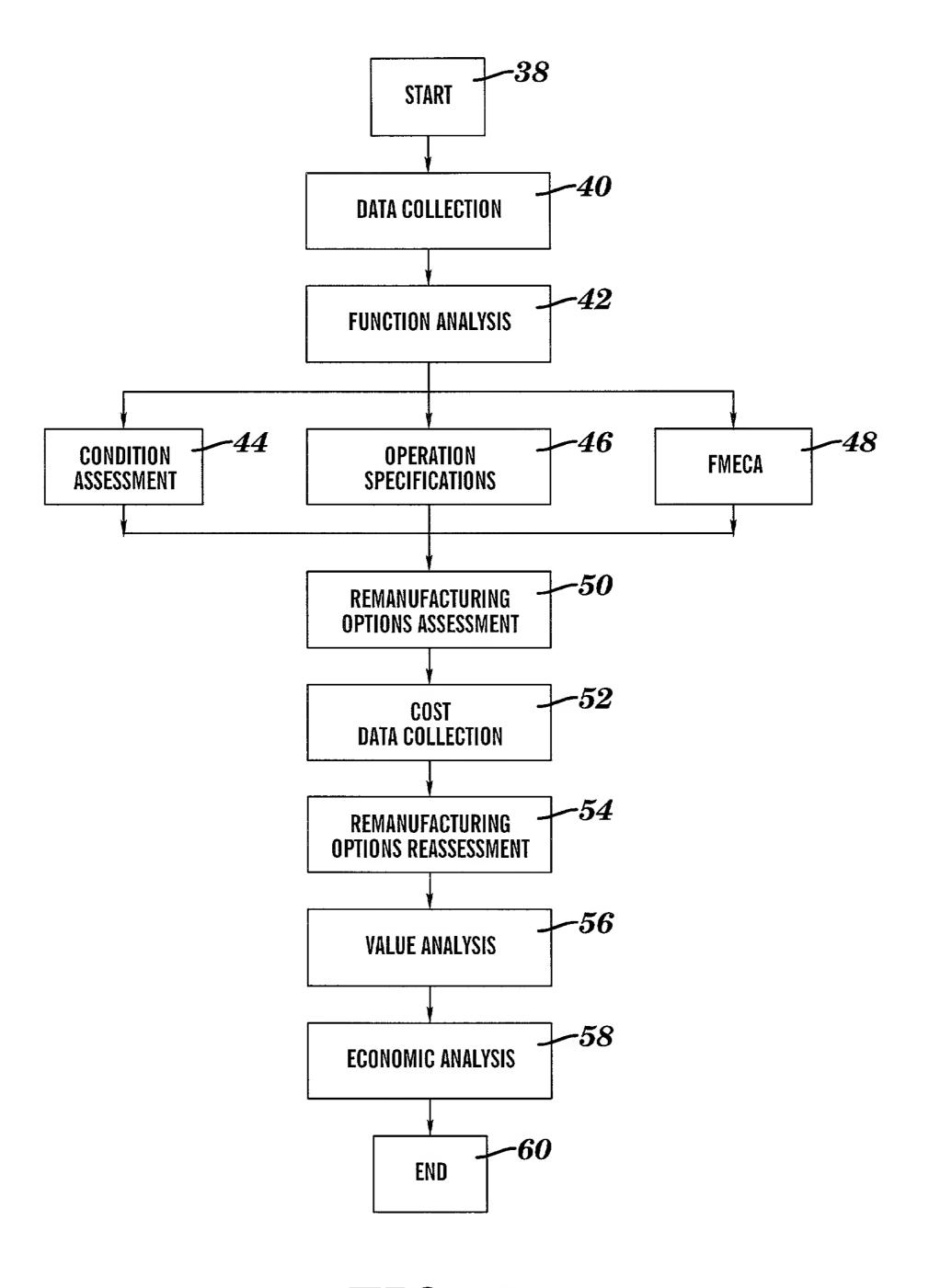
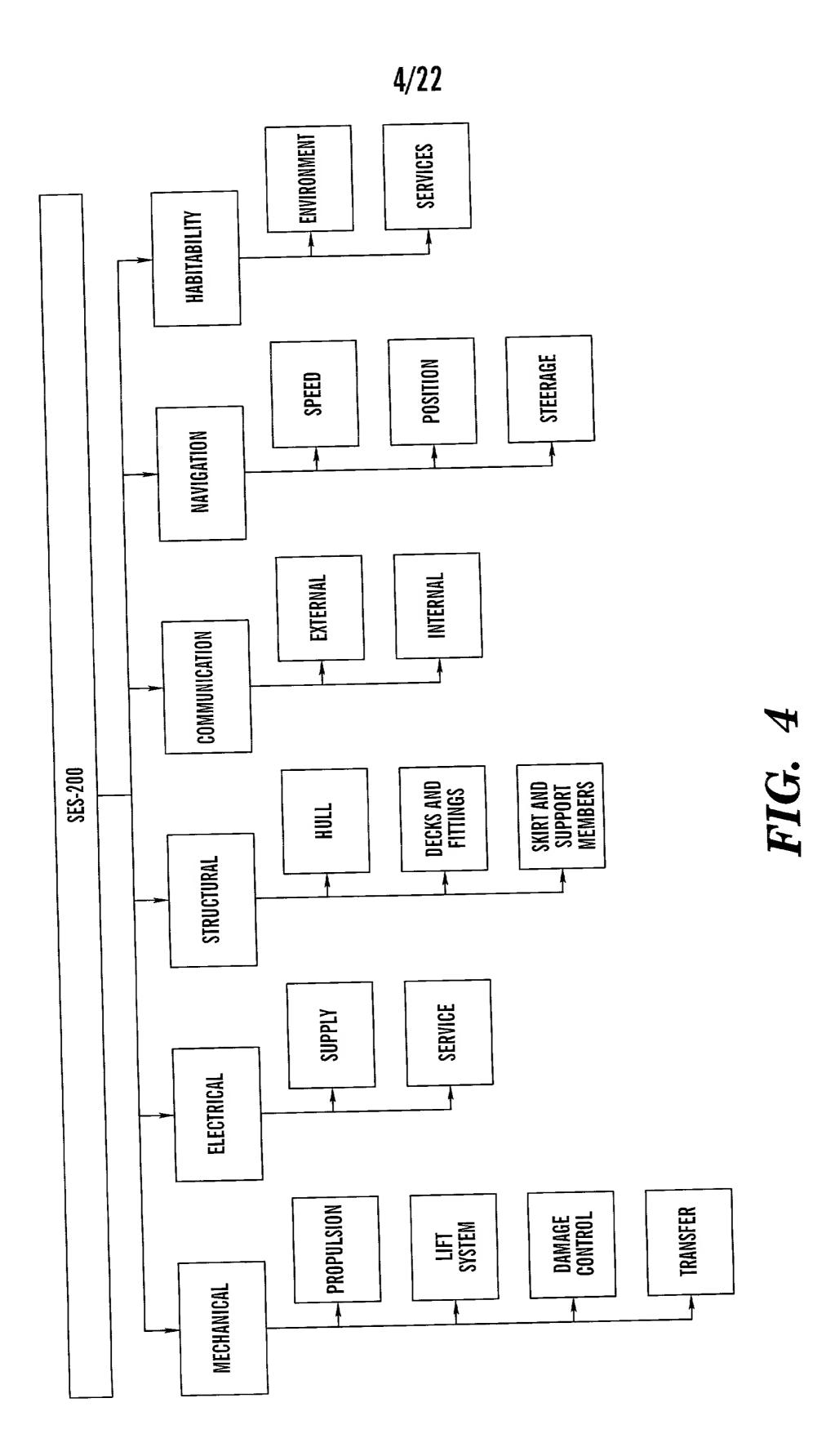


FIG. 2

3/22 Data availability matrix

Annual Contract Security Secur			s G			soos		1		•	64 133.9
System Hierarchy	Fallure tog	Shannak	System Mapul Drawinsis	Finglion	Offile sylvia	sajads Jelliojsilo	rechmology apgrede	Condition Assessment	New Cost (\$)	Destro Misselfing Continu	Percent of dele
MECHANICAL			_							1017	52%
										186	38%
Propulsion				all committee	****						The second second
Drive MTU (port)			×	•	×	×	*		A		
Mounting	×	*	•	•	×				A		
Remote control from the bridge			•		×				A		
Enclosed operator space controls		·			*	-		•	A		
Local controls		X	×	•	×			•	A		
Exhaust		*		•		 	-	 	A		
Ignition		-	-}-	•	×	 			A	1	
Air intake		*	X	-	•	-		•	A		
Reduction gearing			*	ļ		<u> </u>		•	Â		***************************************
Water seal		*		•				•	1		-
Drive shaft	***************************************	, X			-			•	A		
Turbocharger					-	-		•	A		
Salt water cooling		×					-		A	 	
Fuel oil system		×		 	•			•	A		
Engine coolant pre-heater			•		-	. 		•	A	-	
Drive MTU internal air compressor				•	 	-		•	A	 	<u> </u>
Hydraulics		<u> </u>		•			-	•	$\frac{\Lambda}{\Lambda}$		
Engine block components		×				-			A		
Drive MTU (starboard)					<u> </u>		×	•	A		
Mounting	*	×	*		*	*		-	$\frac{\Lambda}{\Lambda}$		
Remote control from the bridge			•	•	*				A		
Enclosed operator space controls					*						
Local controls			•		X				A		
Exhaust	***************************************	×	×	•	×			•	A		
Ignition			×	•	- 		. 		A		
Air intake		×			*			•	A		
Reduction gearing			×	-	•			•	$\frac{A}{A}$	_	
Water seal		×		•				•	ф	<u> </u>	
Drive shaft		*	•	•	_			•	A		
Turbocharger					******************				A		
Salt water cooling		*						•	A		
fuel oil system		X		8					A		
Engine coolant pre-heater		•	3	•	•			•	A		
Drive MTU internal air compressor				•				•	A		
Hydraulics				•				•	A		
Engine block components		×		•				•	A		
KaMeWa jet (port)										 	
Hydraulic powerpack				•							
Hydraulic lines)	(9	ě				•			
Electric heater		3	X X	•							
Jet nozzle			•	•					************	******	
Jet pump			•					***************************************	A		
KaMeWa jet (starboard)											
Hydraulic powerpack								•		***************************************	
Hydraulic fines			x 🏓) A		

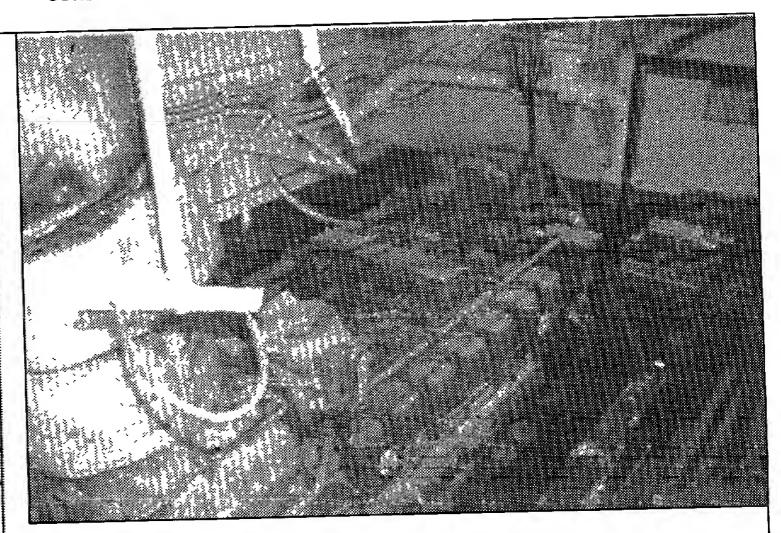


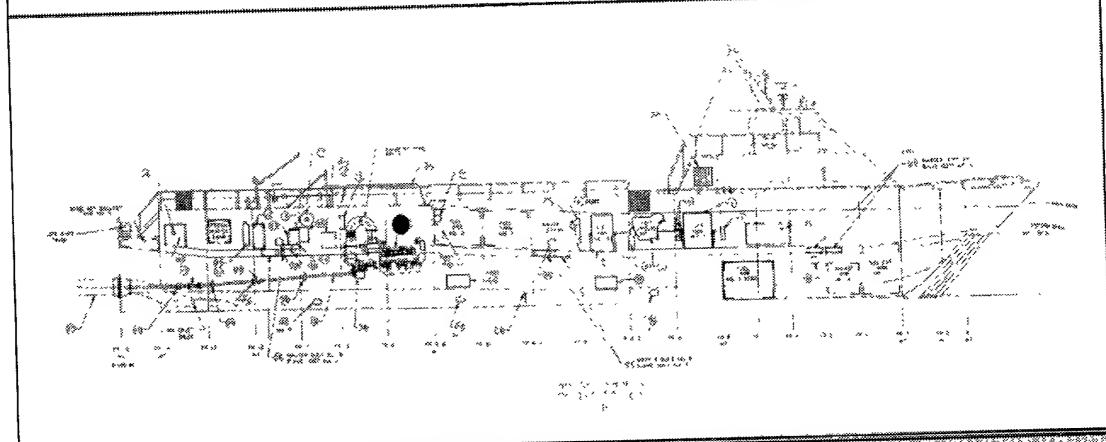
FUNCTION MATRIX

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Provide set per provide control of setting and control of setting an	1	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	Provide means for engine start-up	
Provides provide proping or personal provides and provides and provides and provides and provides control search of the personal provides provide control or provides provide provides	1 00	NAC VYCHONYMAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	Transfer air to engre for complished	
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Roce Bodgo Provide Config to engine exhaust and reduction gearing Investing with stall widner coloning transfer system Provide Config to engine exhaust and reduction gearing Investing with stall transfer country to engine exhaust configuration Provide Config	88	AND THE PROPERTY OF THE PROPER	Transfer power from angine to Kaldevia wateriet punt (post)	- The second of the 1 officers of the second control to the second
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Provide the final of the fight of the control state		T See The		in the
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Provide professory Provide controls Provide controls Provide controls Provide injuries to settle control of the provide control of settlers Provide physical control of settlers are control of settlers Deliver trouge and the control of settlers Provide provide controls Provide provide controls Provide		lank of the state	Heat engine coolan daring externe wrong in the coolan	to main
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Deliver torque los seazoant kaldetva veterior punt. Socrier engine la significantial por provint inscrince and veterior controls. Socrier engine la significantial por provint inscrince and veterior controls. Socrier engine la significantial por provint inscrince and veterior controls. Provide the centralized models for controls of engine function. Provide controls of season between cevitation and control of engines. Provide means for engine starting. Provide means for engine starting. Provide said between controls and returning and control of engine. Provide means for engine of the said several control of engine and returning and control of engine. Provide said between version of kaldetva waterfort party (said of provint frozon) Provide controls of this engine. Provide controls of this engine. Provide incloid to engine and returning to proport frozon. Provide incloid to engine and returning to proportion of the said of the engine province of the engine function of the engine function. Provide incloid to engine and returning to proportion of the engine function. Provide incloid to engine and returning to proportion of the engine function of provide	13		Provide nygrating presents by the contraction events.	The state of the s
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Provide by centralized and profit of single functions of single personnel controls of some state of single functions of single		Accord bysics the hatfall	=	
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Provides said betweer drive shaft and buildhead Transfer power from ergine to KaMeVNa waterjet purry (startogard) Transfer power from ergine to KaMeVNa waterjet purry (startogard) Transfer power from ergine to KaMeVNa waterjet purry (startogard) Provide Leal oil to engine, extraust and reduction gearing Provide Leal oil to engine, extraust and reduction gearing Provide Leal oil to engine, extraust and reduction gearing Provide Leal oil to engine, extraust and reduction gearing Provide Indian Provide Supplied by port drive engine IL notices Provide Indian ancher I sergerate for waterjet manipulation Provide Indian ancher I sergerate around jets Provide Indian ancher I sergerate peasure from powerpark to provide supplied by stated from powerpark forces Convert torque supplied by stated drive engine its provides provide professure from powerpark forces Convert torque supplied by stated drive engine its provides provide professure for waterjet manipulation Provide Indians pressure for waterjet manipulation Provide Indians pressure for waterjet manipulation Provide Indians ancher tengue supplied by stated drive engine its provides professure for waterjet manipulation Provide Indians ancher tengue supplied by stated drive engine its provides properties around jets Provide Indians ancher tengue supplied by stated drive engine its provides properties around jets Provide Indians and directing waterfelow for steemphowers in provides in provide processure from provespeak to waterjet in angulation for provide processure from provespeak to waterjet in angulation for provide provide professure from provespeak to waterjet in angulation for steemphowers in the provide provid	×		In the contract of the contrac	THE VIOLET A STATE OF THE PROPERTY OF THE PROP
Transfer power from engine to KaMawWa wateriot participation of any factor of the coling transfer system provide held to engine to transfer the coling transfer system provide held to engine coling the engine by the coling transfer system provide held to engine color thing extreme weather to prevent feeding participated by the coling thing extreme weather to prevent feeding participated by the coling thing extreme weather to prevent feeding provide provide hydraulic pressure for regime to propulsary funce. Provide hydraulic pressure for regime to propulsary funce. Convert characterized energy (fuel oil) to mechanical energy funce of provide hydraulic pressure for regime to propulsary funce. Frovide hydraulic pressure for regime to propulsary force. Convert characterized enough energy functional provide provide hydraulic pressure for wateriel maniguration. Transfer hydraulic pressure for wateriel wateriel maniguration. Transfer hydraulic pressure for wateriel wateriel wateriel wateriel wateriel wateriel wateriel maniguration wateriel ma	إختدا	อก geanng	aparage aggs (AUSSAULISSEMMANAAAAAAAA	
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Provide held to engine, exhaust and reduction greating interface with fluet oil transfer existent. Provide held to engine functions Provide compressed and foregate functions Report from the hydraulic pressure for engine functions Provide invariant energy (fuel oil) to mechanical energy Convert torque supplied by port dave engine to propulsary torce Provide hydraulic pressure for manipalists Convert torque supplied by stord dave engine to propulsary force Convert torque supplied by stord dave engine to propulsary force Convert torque supplied by stord dave engine to propulsary force Convert torque supplied by stord dave engine to propulsary force Convert torque supplied by stord dave engine to propulsary force Convert torque supplied by stord dave engine to propulsary force Convert torque supplied by stord dave engine to propulsary force Convert torque supplied by stord dave engine to propulsary force Convert torque supplied by stord dave engine to provide propulsary force Convert torque supplied by stord dave engine to provide propulsary force Convert torque supplied by stord dave engine to provide propulsary force Convert torque supplied by stord dave engine to provide propulsary force Convert torque supplied by stord dave engine to provide propulsary forces Convert torque supplied by stord dave engine to provide propulsary forces Convert torque supplied by stord dave engine to provide propulsary forces Convert torque supplied by stord dave engine to provide propulsary forces Convert torque supplied by stord dave engine to provide propulsary forces Convert torque supplied by stord to provide propulsary forces Convert torque supplied by stord to provide propulsary forces Convert torque supplied by stord to provide propulsary forces Convert torque supplied by stord to provide propulsary forces Convert torque supplied by stord to provide propulsary forces Convert torque supplied by stord torque provide propulsary forces Convert torque supplied by stord torque provide propulsary force	261	A STATE OF THE PARTY OF THE PAR	BOOK AKOTA DOWEL	
Provide hel off to engine Heat engine coolant thing extreme weather to prevent freezing Provide recently source to main LP at system Provide recently source to main hydraulic system Provide hydraulic pressure for engine functions Provide hydraulic pressure for mains to propulsary force Convert circus esupplied by gord drive engine to propulsary force Convert temperature around lefts Maintain ambert temperature around lefts Provide hydraulic pressure for waterfiel maintained propulsary force Convert temperature around lefts Maintain ambert temperature around lefts Provide recently waterfiel maintained by state of waterfiel maintained by secure to main hydraulic system Provide recently waterfiel maintained by state of waterfiel maintained by secure to main hydraulic system Provide recently waterfiel maintained by state of waterfiel maintained by state of secure pressure for waterfiel maintained by state of secure for provide pressure for waterfiel maintained by state of secure for provide pressure for waterfiel maintained by state of secure for secure for secure for provide pressure for waterfiel maintained by state for secure for secur	~ 1	SASS CARE I	Provide conting to engine, exhaust and reduction gealing.	Interface with first on transfer system.
Heat engine couldn't turing extreme the countries are compressed as for engine functions	າກ	\$2.81 PT.	10	- 1:
Provide hydraulic pressure for engine to engine to propulsary force. Convert chemical energy ('uel oil to mechanical energy Convert chemical energy ('uel oil to mechanical energy Convert torque supplied by port drive engine to propulsary force Convert torque supplied by port drive engine to propulsary force Convert torque supplied by stud drive engine to propulsary force Convert torque supplied by stud drive engine to propulsary force Convert torque supplied by stud drive engine to propulsary force Convert torque supplied by stud drive engine to propulsary force Convert torque supplied by stud drive engine to propulsary force Convert torque supplied by stud drive engine to propulsary force Convert torque supplied by stud drive engine to propulsary force Convert torque supplied by stud drive engine to propulsary force Convert torque supplied by stud drive engine to propulsary force Convert torque supplied by stud drive engine to provide propulsary force Convert torque arroad ensiry force to man hydraulic system Convert torque arroad ensiry forces Convert tor	S 20	rootant ore-heater		Serve as auxiliary source to main LP air system
Provide Invitability pressure for waterjet manpulation Convert chemical energy ('uel oil) to mechanical energy (configuration of the port drive engine to propulsary ticce Convert chemical pressure for waterjet manpulation Provide means of directing waterjet manpulation Provide means of directing waterjet manpulation Provide hydraulic pressure for waterjet manpulation Convert torgue supplied by situation powerpary forces Convert torgue supplied by situation powerpack to waterjet Transfer hydraulic pressure for waterjet manpulation Provide hydraulic pressure from powerpack to waterjet Mannan ambient temperature around jets Mannan ambient temperature around jets Output seawater under pressure to provide propulsary forces Output seawater under pressure to provide propulsary forces Output seawater under pressure to provide propulsary forces	12	TU internal air compressor	}	Sowe as auxiliary source to main mydraulic system.
Transfer hydraulic pressure from powerpant to propulsary face Provide hydraulic pressure from powerpant to wateried Maintain ambient tamperature around lots Convert considerature pressure from powerpant for propulsary force Convert considerature supplied by stid drive engine to propulsary force Convert considerature pressure from powerpack to wateried Provide hydraulic pressure from powerpack to wateried Transfer hydraulic pressure from powerpack to wateried Maintain ambient temperature around lets Maintain ambient temperature around lets Conput seaware under pressure to provide propulsary forces Output seaware to pressure from powerpack to wateried Transfer hydraulic pressure from powerpack to wateried Maintain ambient temperature around lets Maintain ambient temperature around lets Couple seaware under pressure to provide propulsary forces Couple seaware under pressure to provide propulsary forces	{ T		Provide hydraum pressure to the mechanical energy	
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Transfer hydraulic pressure from powerpars to wateried from powerpars to steel institution and the steel institution of steel institution and the steel institution of steel inst	§ 1	AND THE PROPERTY OF THE PROPER		auxiliary source to main Typiaum of Amin.
Marriain ambert temperature around jets Provide means of directing waterfrow for steering reack Output seawater under pressure to provide propulsary force Convert terque supplied by etted drive engine to propulsary force Convert terque supplied by etted drive engine to propulsary force Convert terque supplied by etted drive engine to provide managine in ampuration from powerpack to wateriet Mandain ambent temperature around jets Mandain ambent temperature around jets Provide means of directing waterflow for steering/reviering Durbut seawater under pressure to provide propulsary forces	3		TOWNS 1112 SEE SEE THE TOWN TOWNS TO WATER	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
Provide means of directing waterflow for steeling/faces Output seawater under pressure to provide propulsary force Convert torque supplied by sittl drive engine to propulsary force Convert torque supplied by sittl drive engine to propulsary force Frovide hydraulic pressure for waterfel manipulation Frovide hydraulic pressure from powerpack to waterfel Manitain ambient torque around lefts Manitain ambient torque around lefts Frovide means of directing waterflow for steemngiveversing Duput seawater under pressure to provide propulsary forces	3		A touristain point and temperature atound 1915	* Symmetric Control of the Control o
Convert torque supplied by stad drive engine to propulsary force Convert torque supplied by stad drive engine to propulsary force Convert torque supplied by stad drive engine to propulsary force Frovide hydraulic pressure from powerpack to wateriel Maintain ambient tomperature around lets Maintain ambient tomperature around lets Provide means of directing waterflow for steam forces.	34	reater	Star real marker of Arechno waterflow for steering reveising	TOTAL OF THE PROPERTY OF THE P
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rpack Transfer hydraulic pressure for wateriel manipulation Transfer hydraulic pressure from powerpack to wateriel Maintain ambient temperature around lefts Provide means of directing waterflow for steering receives Output seawater under pressure to provide propulsary forces	- €}}	Secretary of the contract of t	Convert torque supplied by sthd drive engine to propulsary force	a a contract of the man by death a with the second
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	-	in powerpack	Transfer hydraulic pressure from powerpack to waterjet	6. Company of the Com
	21	K WKS	Mandain anticent temperature around lets	**************************************
AND THE PROPERTY OF THE PROPER	₹!	C SECULAR CONTRACTOR C	Provide means of directing waterlion for steaming reversions	THE REAL PROPERTY OF THE PERTY
		2. Z	A	

FIG. 5

ESWBS
23310
Function Group
MECHANICAL
System
Propulsion
Subsystem
Drive MTU
Item description
Drive MTU port





Frame location: 8-6 to 8-10	(11) Por	
Manufacturer:	Model #: Part #:	Serial #:
Detroit Diesel	MTU 16V-396 TB94	559-0477

Mounting, Remote control from the bridge, Enclosed operator space controls, Local controls, Exhaust, Ignition, Air intake, Reduction gearing, Water seal, Drive shaft, Turbocharger, Salt water cooling, Fuel oil system, Engine coolant pre-heater, Aux drive MTU air compressor, Hydraulics, Engine block components, *Operating hours meter = 1930.68 hrs *Turbo rusted *Slight corrosion or other surface damage *Air intakes missing *Water buildup in drive shaft compartment *Coolant manifold severely cracked * Large coupling on drive shaft (FR 13) corroded *Wt. = 6685 kg *2560 kW *2150 RPM *Sea water cooling fitting to reduction gear cracked *See detailed report from Florida Detroit Diesel-MTU for more information

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OPERATION SPECIFICATION MATRIX

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Operational Specification	MTU 16V396TB94, Liquid cooled, Four-stroke desel engine, Anti-clockwise direction of rotation, High Performance Rating Class 1DS- Fast Vessels, Certification w/classifiable power (0.909 x rated power) from all leading classification societies, Fuel Power Stop kW (mhp), 2590 (3482), Engine culput; 3200 btrp each, Speed RPM: 2150, Gearbox Model: BW 755 Free-standing, Transmission Ratio: 2.33 ° 1, Bore/Stroke mm (m.), 165/185 (6.5/7.3), Total Displacement L (m²); 53.4 (3886), Intake air temp. 25°C / Sea water temp. 25°C / Sea water temp. 25°C / Sea water temp.	Flanges and conical rubber elements	Sheet-steel housing wiresilient mounts	Speed, Temperatures (coolant, raw water, charge air, exhaust before turbine), Pressure (block, non-return valves, coolant & raw water tines), Fluid levels	Exhaust das furbo-charging	Electric states	Combustion air system- intake filter strainer w/attaching hardware	Valve gear and gear train. Behr BW755, Serial #219 (STRSD) #220 (PORT), Ratio 2,33 : 1
Statem Subsystem Element Plant Subsystem	Probalsion Drive MTU (port)	Mounting . Remote control from the bridge	Enclosed operator space controls	Local controls	EXMAUST	lankian	Air intake	Reduction geating

FIG. 8

9/22
FAILURE MODES, EFFECTS, AND CRITICALITY ANALYSIS (FMECA)

System	Subsystem		Failure Modes	Cause
Propulsion	Drive MTU	Deliver torque to KaldeWa waterjet	企业的企业	
		pump		
	0.	Secure engine to ship framing to prevent movement and vibration	Mounting fails	Wear
	***			Согговюя
	***************************************			Manufacturer's defect
	-	Provide means to control engine from bridge for navigation purposes	Remote control from the bridge fails	Power Failure
				Circuit Interruption
	**************************************	Provide for centralized monitoring and control of engages	Enclosed operator space controls fail	Power Failure
	03334			Circuit Interruption
	000000000	Provide local control of engine functions	Local controls fail	Power Failure
				Circuit Interruption
	ob formand of the control of the con	Expel combustion gases to extenor of ship	Exhaust fails	Obstruction
	generation and the second seco			Faulty Seal
	The state of the s			Damaged Piping
	TT-7-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2	Provide means for engine start-up	Ignition fails	Air System Failure
	Tribination of the state of the	1 TOYAGE MEGINE TO: ENGINE SECURITY		Power Failure
	Try control of the state of the			Circuit Interruption
		Transfer air to engine for combustion	Air intake fails	Obstruction
		Reduce RPMs to KMW jets to prevent	Reduction gear fails	Wear
	The state of the s	cavitation		Corrosion
	Levino			Insufficient Lubrication
	var vergeneere de la company d			Manufacturer's defect
		Fransfer power from engine to	Drive shatt fails	Wear
		KaMeWa waterjet pump (port)		Corrosion
		·····		Load
				Manufacturer's defect
	Andreas Andrea	Provides seal between drive shaft and	Mistor Soal looks	Wear
	***************************************	bulkhead	**ater Georiesmo	
	dation		To the state of th	Manufacturer's defect
{		Boost engine power	Turbocharger fails	Wear
				Corrosion
		Provide cooling to engine, exhaust and reduction beaming		Manufacturer's defect
		radiction beautio	Salt water cooking fails	Wear
	***************************************			Corrosion
	-	tions project series to disease and series		Manutacturer's defect
	TOPP CHARACTER AND A STATE OF THE STATE OF T	l leat engine coolant during extreme weather to prevent freezing	Kim HotStart Engline Coolant Heater fails	Power Failure
		-		Electrical grounding

FIG. 9A

10/22
FAILURE MODES, EFFECTS, AND CRITICALITY ANALYSIS (FMECA)

an in the second se	Secondary Effect	Utilinale Sitael	Determin	è Se S	lva.	7 1 1
		dia dia				
Excessive engine vibration/movement	Engine fadure/orive train damage	Compromised propulsion to ship	Audibie	7	3	21
Excessive engine vibration/movement	Ençme fullureranve train damaça	Compremised propulsion to ship	Audible	7	3	21
Excessive engine vibration/movement	Engine foture/drive train demage	Compromised propulsion to ship	Audible	7	2	14
Loss of engine control from bridge		Inability to remotely control engines	Operational Failure	4	3	12
Loss of engine control from bridge		Inability to remole'y control engines	Operational Failure	4	5	20
System fails to respond to controls from ECI1	Loss of remote control of engine (from bridge)	Compromised propulsion to ship	Operational Failure	6	3	18
System falls to respond to controls from ECR	Loss of remote control of engine (from bridge)	Compromised propulsion to ship	Operational Failure	6	3	18
Total loss of engine control	Puneway engins	Catastrophic damage to engine/potential loss of ide	Audible	9	1	9
Total loss of engine control	Runaway engine	Catastrophic damage to engine/potential loss of life	Audible	9	1	9
Excessive packpressure	Stall engine	Compremised propulsion to ship	Gaging	6	1	6
Exhaust blow-by	Air quality in ship compromised	Health hazard	Gaging/Visual	9	4	36
Exhaust blow-by	Air quality in ship compromised	Health hazard	Gaging/Visual	9	4	36
Engine will not start		Compremised propulsion to ship	Operational Failure	7	4	28
Engine will not start		Compromised propulsion to ship	Operational Failure	7	4	28
Engine will not start		Compromised propulsion to ship	Operational Failure	7	4	28
Reduced airflow to engine	improper combustion	Compromised propulsion to ship	Gaging	4	2	8
Gearbox/drive shaft damage	No power transmission to KaMeWa	Compromised propulsion to ship	Visital	6	4	24
Gearbox/drive shaft damage	No power transmission to KaMeWa	Compromised propulsion to ship	Visual	6	4	24
Gearbox/drive snaft damage	No power transmission to KaMeWa	Compromised propulsion to ship	Visual	6	5	30
Gearbox/drive shafi damage	No power transmission to KalleWa	Compromised propulsion to ship	Visual	Ĝ	2	12
Bent/broken drive shaft	No power transmission to KaMeWa	Compromised propulsion to ship	Visual	€	4	24
Benl/hroken drive shaft	No power transmission to KaMeWa	Compromised propulsion to ship	Visual	6	4	24
Beni/broken drive shaft	No power fransmission to KaMeWa	Compromised propulsion to ship	Visual	6	5	30
Bentrorokan drive shaft	No power transmission to KaMeWa	Compromised propulsion to ship	Visual	6	2	12
Seawater leakage	Ship's Irim affected	Below deck water/ flooding	Visual	7	4	28
Segwater leakage	Ship's frim affected	Below deck water/flooding	Visual	7	2	14
Ne boost	Decreased engine output	Reduction in engine efficiency	Gaging	3	4	12
No boost	Decreased engine output	Reduction in engine efficiency	Gaging	3	5	15
No boost	Decreased engine output	Reduction in engine efficiency	Gaging	3	2	6
Engine/Gearbox-Exhausi Overheats	Engrise fallure	Compromised propulsion to ship	Caging	G	2	12
Engine/Cearbox/Exhaust Overheats	Engine failure	Compromised propulsion to ship	Gaging	6	3	1B
Engine/Gearbox/Exhaust Overheats	Engine tailure	Compromised propulsion to ship	Gagang	6	2	12
inability to preheat coplant at start-up	Potential thermal stressing	Engine failure/thermal cracking of engine block	Gaging	7	3	21
inability to preheat coolant at start-up	Potential thermal stressing	Engine fasture/thermal cracking of engine block	Gaging	7	3	21

Remanufacturing Options
Modify Restore Reuse Renove ~ **~** ~ 7 --REMANUFACTURING OPTONS CRITERIA ŧ Operation Specifications
Name Doesn't Meet -7 ``` _ + Catheal Non-Catical 7 > 25 Condition Good Far Poor **-**444 > 7 7 7

FIG. 10

12/22

REMANUFACTURING OPTIONS MATRIX

Legend:	identifice entire so a "hoet"	possible choice in the remanufactu	rina nrocecc			
	identitios option as a cost	modum choice in the remainder				
	Identifies option as a possib	le choice in the remanufacturing pa	rocess			
	Identifies option as not feas	ible in the remanufacturing process	څ			
				n.	O	Ů.
						ACCE TO TO TO TO TO TO TO TO TO TO TO TO TO
Propulsion						
.,	Drive MTU (port)				***************************************	
Marosiichteacracosticheacacristice verveenieuwe	Mounting					
***************************************	Remote contr	ol from the bridge				
19000000000000000000000000000000000000	Enclosed ope	rator space controls				
	Local controls	3				
	Exhausi					
	ignition					
	Air intake					
	Reduction ge	aring				
	Water seal					
	Drive shaft					
	Turbocharger				. بعد د	
	Salt water co	oling	.27			
	Fuel oil syste	m				
	Engine coola	nt pre-heater				
	Drive MTU in	ternal air compressor				
	Hydraulics		, si şi			
	Engine block	components				
	Drive MTU (starboard)					
	Mounting					
	Remote cont	rol from the bridge				
	Enclosed ope	erator space controls				34.31
	Local control					
**************************************	Exhaust					
	lanition					

FIG. 11

	- Ai	HIORE	Hef		F	7					6778	773	r@daimlerr	uotatton	J a	oofart pre- ea hehind th			
	Technical Feasibility	Reman Delimitions			00000000000000000000000000000000000000				Phil Wasinger		(++ 202) 414 6778	(+1,202)4146773	phi_wasinger@daimlerwa	Source Amerence Request for Quotation	Option	The price quote is per engine and brokudes condruls, monitoring systems and engine codant pre- nexer (607,000). Remove the current air inlet housing and move to side of hull or area behind the			
	go to Tachn				oppopological de la companie de la c				Contact Name	Referred By	Phosie Kiamber	Fax Munither	Emæl	Hafferenz e	>	ring systems d move to ski			
	10: 1405		-04/7 Mates		especial descriptions of supplies	***************************************		y ane)			£			Source	Responsible SGV	dreds, monite A kousing an			
		smber	Serial Number 559-0477		on the contraction of the contra			are based on quantify one)	MTU Friedrichshafen w/ DC	1401 H, Silbert, N.W., Suke 706	8 51		20002		Resp	includes con prent air ink			
	Final Notes	Part Nember	7875 85.00Fe6 64					are basad	U Friedsichsh	11 H, Silver, N.W.		WASHINGTON	Z# Z0005			ir engine and amove the cl			
	8 00.0000 1000.00000000000000000000000000			Economis Impractical	mpractical Possible	Dest	Impractical	(all prices		Address 1 140	Audress2	CRV WA	State DC	ment Parts	ometion	The price quote is pe			2 .0 T*4 14 3
	Main engine #2 (pott) Reman Cast Calculations Summary	MTU	Model 16V-396 1894	reconical Impractical	Impractical Possible	Best	Impractical	-	Company Name	Ad	Ad			Replacement Pa	Other Information	The pric	pilot hou		*
Ŷ	Main engine #2 (poff) kaman Cast Calculations	upment Manufactures MTU	Model				Rause In	Cuantify	Reman Option	* .	Cost	\$647,000,00	mstallation Cost	Shipping Cost	\$0.00	\$5,000.00	Salvage Valide	Arsu, mulanu an Cuerte Type	
M Room .	Main bh Reman Ci	Fgupment		Option	Remove	Kes	Rei	0	P Permis	Renace	Option Cost	*	Ž				Ş.		Resold
Records Tools		Remote contro	Local confrois (Canada)	Air intake	Sall water coo	ruerum stateri Engine coolan	Internal air co	engine #1(stac	Remote confr Finitized aper	Local controls	es.	lgerijon Air misike	Turbocharger	Fuel all systen	Engine coolan Internal air cor	Engine black ्रि	Kallevia jet (otbd) 🐺	at (port)	
forest tratte	-kNiCAL Propulsion	S. Remote control	Cotal Co	Airmiake Tukocha			Intern			_	Exhaust Latter				SS THE SS THE SE	2 P. C.	24 344	S Waterseal (bord)	8 38 79
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#14 * 24				e o o o o o		,,,,	• • •		,, w		, ,	, ,,					,, , , ,		

FIG. 12

COST AVAILABILITY MATRIX

= DATA COLLECTED
= NEED MORE INFORMATION TO PROCEED
= ABLE TO LOOK FOR REMAN COSTS
= IN THE PROCESS OF GETTING COST INFORMATION
= NEED THE REMOVAL COST

=DATA NOT REQUIRED

14/22 (1000) ii. pulasiyi greg SGV SGV SGV 300 A 3 ä SGV SS រូបខរុប១០ បាញ Waiting on James Brown BHEIS Getting other costs Getting other costs Waiting on Frank Frank Waiting on Frank Waiting on Frank Waiting on Frank Waiting on * Done Done × EMELLIO). Allegia (estve) *** ALONS III - JAOMEN ត្**នព្**តម្នាក់ពេក · confe ebelgeff -wek nt,etc. Hull (Shell Plating, Stringers, Frames, Outlets) - drydock dean, bai Infl.Engine/Englosed Operator Space Controls Switchboard Generator Control Panel Heads dathines 4, sinks, ploing, etc.). Tanks (Fuel Oil -4, Ballast -6, Lube, -1 Ship Service Diesel Generators (2) KaMe)Wa Hydraulic Powerpacks (2) I.P. Air Compressors starboard Water, Trohi Doors (WTD's) LIP Air Compressors port KaMeWa Waterlets (2) NTU Liff Engines (2) Drive MTU Engines (2) Fremain Pumps (2) Reduction dearing (2) Electrical Wiring Weather Deck Halon System Seachests (5) = DONE

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Recovery	Impractical II	Impractical	Possible	Best	Impractical	
	Modify Impractical I	Remove Impractical I		Restore Best	Reuse Impractical	
Option Recovery			Replace Possible			

FIG. 14A

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218	7. Ta	- Te	Dependent on recovery option for main drive MTU		
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		ve Impractical Impractical 🖈	Best	3	
		move Impractical Impractical *	Best	3	
Option Recovery Economic		Remove Impractical Impractical X	Best	3	
	Modify Impractical Impractical -	Remove Impractical Impractical *		Restore Possible -	

FIG. 14B

REPLACE Kim Hotstart w/ internal unit REPLACE Kim Hotstart w/ new unit RESTORE Kim Hotsuart REQUIRES RESTORE MTU engine RESTORE MTU engine REPLACE MTU engine Scenario #1: Scenario #2: Scenario #3:

FIG. 14C

PAIRED COMPARISON MATRIX Determining Weights for value analysis

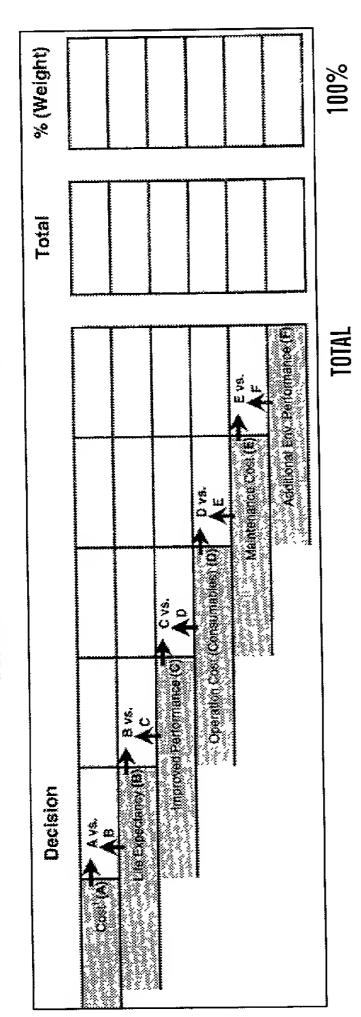


FIG. 15

PAIRED COMPARISON MATRIX Determining weights for value analysis

Decision					}	Total	% (Weight)
	~ · · · · · · · · · · · · · · · · · · ·	A A	A	A		♡	20%
	8	S	***********	Ω		ıΩ	33%
		~	*********	O		4	27%
	Charama Cos (Consumant		۵	۵	· · · · · · · · · · · · · · · · · · ·	ત્ય	13%
•		AN CONTRACTOR	Milenance Bose	200		-	%1
		7 X	Additional	v. Performance E		0	%0
				TOTAL			100%

FIG. 16

Renjace Reman Option	% (Weight)	Ratings
Cost (A)	20%	***
Life Expectancy (B)	33%	***
Improved Performance (C)	27%	***
Operation Cost (Consumables) (D)	13%	
Maintenance Cost (E)	7%	**************************************
Additional Env. Performance (F)	%0	Ç")

FIG. 17A

Restore Reman Option	% (Weight)	Ratings
Cost (A)	20%	ಞ
Life Expectancy (B)	33%	~
Improved Performance (C)	27%	<*>>
Operation Cost (Consumables) (D)	13%	77)
Maintenance Cost (E)	7%	**
Additional Env. Performance (F)	%0	53
	Severe mention of the second o	

FIG. 17B

7(B) 20% 4 rmance (C) 27% 4 (Consumables) (D) 13% 3 ost (E) 7% 4 Performance (F) 0% 3	Replace Reman Option	% (Weight)	Ratings	Score
(B) 33% 4 mance (C) 27% 4 (Consumables) (D) 13% 3 sst (E) 7% 4 Performance (F) 0% 3	C081 (A)	20%	4	0.80
mance (C) 27% 4 (Consumables) (D) 13% 3 sst (E) 7% 4 Performance (F) 0% 3	Life Expectancy (B)	33%	4	ල ල -
(Consumables) (D) 13% 3	Improved Performance (C)	27%	4	1.0
Set (E) 7% 4 Parformance (F) 0% 3	Operation Cost (Consumables) (D)	13%	ෆ	0.40
Parformance (F) 0% 3	Maintenance Cost (E)	7%	*	0.27
	Additional Env. Performance (F)	%0	හ	0.00

FIG. 18A

3.87

TOTAL

Restore Reman Option	% (Weight)	Ratings	Score
Cost (A)	20%	m	0.60
Life Expectancy (B)	33%	Ą	
Improved Performance (C)	27%	3	0.80
Operation Cost (Consumables) (D)	13%	3	0.40
Maintenance Cost (E)	7%	4	0.27
Additional Env. Performance (F)	%0	3	0.00

FIG. 18B

3.87

TOTAL

Paired Comparison Watrix Determining Weights for Value Analysis - Main MTU Engine/Kim Hotstart Scenario
Operation Cost (Consumation ID
and the control of th

FIG. 19

	% (Weight)	Hatings	
CQS* (A)	200	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	880
Life Expectancy (B)	ě,		
Inproved Performance (C)	27%	***************************************	S
Operation Cost (Consumables) (D)	**	**************************************	800
Waintenance Cost (E)	% Z	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	9
Additional Env. Performance (F)		**************************************	S

7 00	ZUA
くト	rig.

	S SOICH	Ratings	Score	
(A) (A)	20%	4		granner.
Life Expectancy (B)	33%	*	2	***************************************
Improved Performance (C)	i	***************************************	8	
Operation Cost (Consumables) (D)		~		-Šocoo
Maintenance Cost (E)		**************************************	8	
Additional Env. Performance (F)	**************************************	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	800	·
		The state of the s	***************************************	**
			e e e	

FIG. 20B

(B) 33% 4 nance (C) 27% 3 Consumables) (D) 13% 3 st (E) 7% 3		% (Weight)	Hatings	
33% 27% 13% 33% 34% 36% 38%	Z\$\$ (A)		***************************************	8
2% 13% 3% 3% 3% 3% 3%	ie Expeciency (B)		*	****
13% 7% 3 7% 3	mproved Performance (C)	*	~	
7% 3	Prenation Cost (Consumables) (D)		~~~	S
89% A	daintenance Cost (E)		~	83
7	Additonal Env. Performance (F)	~	8	8
				r) r)

FIG. 20C

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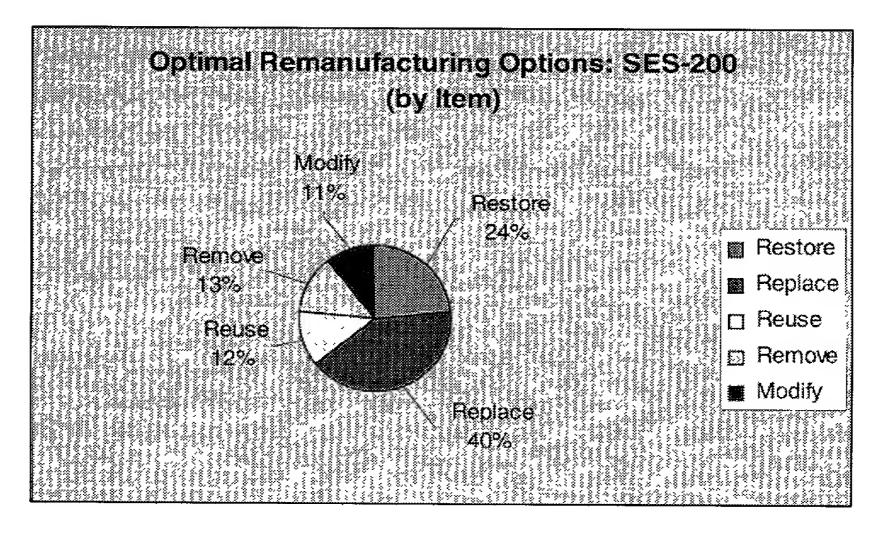


FIG. 21

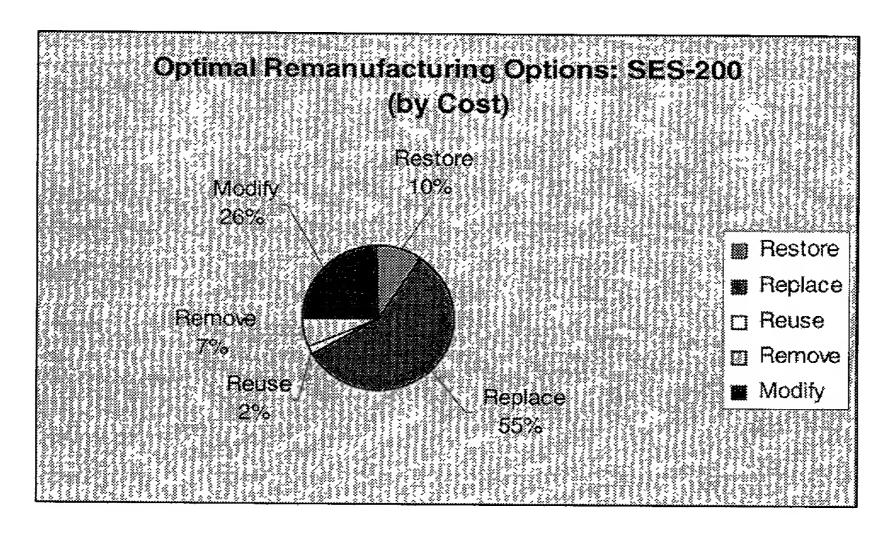


FIG. 22

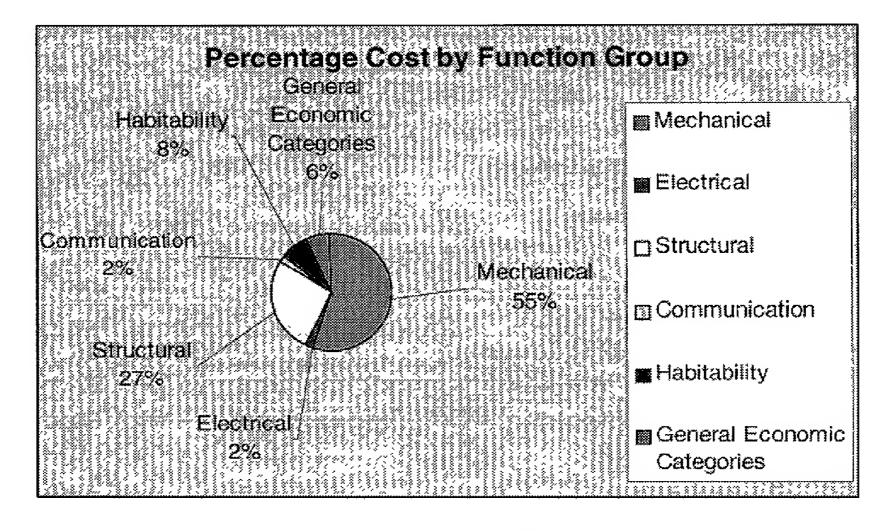


FIG. 23